

CITY COUNCIL REPORT  
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TO: Mayor and Council Members

FROM: Brad Hill, R.G., Water Services Director  
Erin Young, R.G., Water Resources Manager  
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CC: Barbara Goodrich, Shane Dille, Shannon Anderson, Leadership Team

SUBJECT: Governance/Management of Water during Times of Shortage

The question was asked by City Council what policies/ordinances are currently in place that address how the City governs/manages its water in times of shortage. City Code and Council-adopted water policies provide staff direction on how water is governed/managed in times of shortage. Table 1 lists the applicable city code and water policies.

Table 1

- I. City Code: 7-03-001-0014 Water Conservation
- II. Utilities Integrated Master Plan: Principles of Sound Water Management, Water Policies Chapter adopted by City Council by Resolution No. 2014-13 (dated April 1, 2014)
  - B. Water Resource Management  
Policy B2 Water Adequacy
  - F. Infrastructure Policy  
Policy F1 Water System Capacity Redundancy  
Policy F2 Water System Capacity Allocation
  - G. Master Planning  
Policy G1.1 Water Resources Master Plan  
Policy G1.2 Water System Master Plan

Simply put, City Code gives the authority (Water Services Director recommendation to City Manager) on how to respond to the management of our water in times of shortage while the water policies provide guidance on what steps staff should take to minimize a shortage to occur in the future. As background, the last time the City of Flagstaff had a major potable water shortage was 2002 due to several years of record-setting conditions with little precipitation and above-

average temperatures, leading to minimal snowmelt and extremely low water levels in Upper Lake Mary (i.e., impacted by drought). At that time, the City invoked Water Availability Strategies 1, 2, and 3 (Voluntary Water Awareness, Mandatory Water Restrictions, and Water Emergency, respectively) identified in City Code. Many factors have changed since that time, including a reduction of Strategies from 4 to 3 by combining the Voluntary and Mandatory Levels into one, to help prevent these types of potable water shortages from occurring. The adoption of Water Policies in 2014 are an outgrowth from that time. These are explained below in more detail, in simple terms, how both City Code and Policy each provide direction on how water is governed/managed in times of shortage.

It is important to note that a major wildfire in one of our watersheds (e.g., Upper Lake Mary or Woody Mtn) could have a significant impact on the City's ability to provide adequate water production. For example, a wildfire in Upper Lake Mary with subsequent monsoon rains could render the lake untreatable for an extended period of time with too much suspended solids and organic carbon flowing into the lake. Or a wildfire in Woody Mountain wellfield could burn up well houses and the above-ground powerlines rendering this wellfield inoperable for a period of time.

**Governance/Management of Water in Times of Shortage**  
*City Code: 7-03-001-0014 Water Conservation*

This section of City Code establishes three levels of Water Availability Strategies that govern the use of potable water by any user in the City, either in times of shortage or normal water supplies. Each strategy becomes more restrictive in limiting water use and Code identifies those uses that are prohibited. For more specifics of which water uses are prohibited within each Strategy, the entire City Code 7-03-001-0014 is attached. The names of each Strategy are as follows:

Strategy 1: Water Awareness (*City is always in this Strategy*)  
Strategy 2: Water Emergency  
Strategy 3: Water Crisis

City Code states that the City Manager, upon recommendation of the Water Services Director (Utilities Director), after notification to the City Council is authorized to declare and suspend Water Availability Strategies and elements of strategies based upon Resource Status Levels. Resource Status Levels are defined in City Code as follows:

Resource Status I: when water demand is equal to or less than safe production capability which is defined as 90% of the total water resources are available based on total potable water production measured in million gallons per day (MGD).

Resource Status II: when water demand exceeds the safe production capability for five (5) consecutive days

Resource Status III: when water demand exceeds total production capability and the amount of water in storage may impair fire protection for the City.

Should the City need to implement Water Availability Strategy 2-Water Emergency, public education and enforcement will be a key factor. Communicating to the public to reduce their water use and provide education on which uses would become prohibited will be critical. A significant public outreach campaign would need to be developed and implemented including easy to understand advertisements for the newspaper, radio, Facebook, email, etc. Enforcement will be another key factor to ensure the public is adhering to all prohibited water uses. The existing Water Conservation enforcement aides on staff (two) would be used in this capacity but we may need to consider additional staffing or a temporary shifting of staff duties.

To better understand when the City would declare a water shortage, staff provide two examples; one with all water supplies available and a second example with a wildfire impacting the quality of Upper Lake Mary water making it untreatable.

#### Examples on when the City would declare a Water Shortage

##### All Water Supplies Available:

The calculation to determine when or if the City would enter into a water shortage and need to implement Strategy 2 – Water Emergency would be as follows: The Total Production Capability (including redundancy) is 17.6 Million Gallons per Day (page 5, 2019 Report to the Water Commission). Therefore, the Safe Production Capability is 15.84 MGD ( $17.6 \text{ MGD} \times 90\%$ ). Should the community's water demand exceed 15.84 MGD for five (5) consecutive days (Resource Status II), then staff would request the City Manager to implement Strategy 2-Water Emergency. *As of today, the City's peak (or maximum) day water usage is approximately 9.47 MGD which is only ~60% of safe production capability and not near 90% that would trigger a water shortage.*

##### No Upper Lake Mary surface water due to a wildfire:

The calculation to determine when or if the City would enter into a water shortage and need to implement Strategy 2 – Water Emergency would be as follows: The Total Production Capability available (including redundancy) without a water supply Upper Lake Mary is 11.6 Million Gallons per Day (page 5, 2019 Report to the Water Commission). Therefore, the Safe Production Capability is 10.44 MGD ( $11.6 \text{ MGD} \times 90\%$ ). Should the community's water demand exceed 10.44 MGD

for five (5) consecutive days (Resource Status II), then staff would consider requesting the City Manager to implement Strategy 2-Water Emergency. *As of today, the City's peak (or maximum) day water usage is approximately 9.47 MGD, which would be 91% of the Safe Production Capability if Upper Lake Mary surface water becomes untreatable due to impacts from a wildfire. If this were to occur, the Water Services Director would take into account many variables to consider whether to recommend lowering water demand by implementing Resource Strategy II: Water Emergency.*

**Water Policies Implemented to help prevent a Water Shortage**

*Utilities Integrated Master Plan: Principles of Sound Water Management  
Water Policies Chapter*

Multiple significant initiatives were implemented by staff over the past 10+ years in response to the water shortage that occurred in 2002 and to ensure sound water management into the future. One primary purpose of these water policies is to better preserve the public's trust and demonstrate leadership in the stewardship of our limited natural resources.

In 2008, staff brought a series of policies to the Water Commission for discussion and debate. Some of the policies were what staff had already been doing informally while others were new. After four (4) years of work vetting each policy, the Water Commission recommended to advance them to City Council for their consideration and adoption. City Council subsequently held ten additional public meetings and then adopted the water policies in April 2014. The policies that specifically relate to how the city governs/manages its water during times of shortage are highlighted below:

- a. *Five-year cycle of master planning (water resource & water infrastructure) that are each tied to the land uses contained within the voter approved Regional Plan (Policies G1.1 and G1.2):* The City's first ever Water Resources Master Plan was completed as a draft in 2011 and is currently being updated in 2019/2020. The City completed its last water infrastructure master plan in 2014. However, prior to 2014, the last time a comprehensive water infrastructure planning effort was completed dated back to the 1980s. Both of these planning efforts are critical to guiding staff, the community and City Council on the establishment and funding of a Capital Improvement Program that are designed, in part, to help mitigate water shortages today and into the future. This is accomplished by maintaining proper Safe Production Capability, as referenced in City Code, as well as associated water delivery infrastructure and system water storage, to match that of the growing community.

- b. *The introduction of redundancy into our water supplies and water infrastructure (Policy F1):* Leading up to the 2002 water shortage, the City maintained a diversified water supply portfolio of Upper Lake Mary surface water, groundwater wells and reclaimed water. However, drought impacted Upper Lake Mary, and at that time, the City had insufficient groundwater wells to compensate for diminished surface water supply. This decreased water production capacity led to the implementation of Strategy 2 - Water Emergency in City Code. To help prevent that from occurring again, the concept of redundancy was introduced into our system. Two critical initiatives were implemented to improve system redundancy:
- i. In 2004, a \$8.5M Bond was approved by the voters to drill and construct new local water supply wells. This funding allowed the City to drill three (3) new wells that increased groundwater production capacity by ~2.5 million gallons per day (MGD).
  - ii. Water Rates: City Council approved water rate increases in 2016 that funded an additional five (5) new water supply wells. The purpose of this funding is to add water production capacity ahead of planned growth in order to ensure sufficient water production redundancy.

The role this policy alone has played in preventing water shortages is significant. For example, today the City maintains peak groundwater production capacity of 11.18 million gallons per day (MGD) that includes 15% redundancy (i.e., accounting for one large capacity well goes down indefinitely, p. 17, 2019 Report to the Water Commission). When compared to the City of Flagstaff's 3-year average peak-day water demand of 10.9 MGD (p. 2, 2019 Report to the Water Commission), Water Services can provide nearly all of the community's water needs from groundwater. *This policy requiring redundancy in our water resources and water production capacity alone has played a significant role in mitigating any future water shortages.*

- c. *Tracking the commitment of our water supplies and the allocation of our water system capacity tied to City Council approved current and planned future growth (Policy B2 and F2):* The City of Flagstaff obtained its current 100-year Designation of Adequate Water Supply from the Arizona Department of Water Resources in April 2013. This Designation quantified the volume of water resources (paper and wet) that the City can rely upon over the next 100-years. Complying with this Designation required the City to establish a link between City Council approved growth (subdivision plats and changes in land use) with long-term water supplies.

Additionally, Policy F2 helps to mitigate future water shortages by not over-committing our water system capacity. This policy establishes benchmarks

on when new water production infrastructure needs to be developed compared to the City's peak day water demand requirements. The benchmarks are as follows:

Strategy F2.1a at 80% of committed peak day demand, the Water Services (Utilities) Division will identify additional sources, treatment capacity needs, funding options, start design and necessary land acquisition for increase capacity needs.

Strategy F2.1b at 85% of committed peak day demand – the Water Services (Utilities) Division will begin construction to expand necessary facilities

Strategy F2.1c at 95% of committed peak day demand – the Water Services (Utilities) Division will have completed construction and all necessary regulatory agency permits will have been obtained and full operation.

It is important to note that City Council authorized Water Services to purchase three additional trailer-mounted back-up generators in 2018, in order to maintain a minimum service level of water production during a time of catastrophic power loss. While not established in City Code or the Water Policies, power supply is an essential piece of the Total Production Capability and Safe Production Capability calculations.

Implementing both of the tracking policies has helped to mitigate water shortages by ensuring that the City does not over-commit both its water resources and water system capacity.

**City Code: 7-03-001-0014 Water Conservation**

The City Manager, upon the recommendation of the Water Services Director (Utilities Director), after notification to the City Council is hereby authorized to declare and suspend Water Availability Strategies and elements of Strategies. The Strategies may be initiated and suspended based upon Resource Status Levels, or other pertinent information, which evaluate the relationship between water demand and municipal safe production capability.

E. The following Water Availability Strategies shall govern the use of City water by any user of the City potable water system, as prescribed below:

1. Strategy I: Water Awareness (may implement with Resource Status I). Conserve water, in and outside of the home, using the best practices available to minimize waste. Water users are specifically encouraged to landscape with plant materials requiring little or no supplemental irrigation water. The following uses are restricted or prohibited.

No person shall:

- a. Irrigate between the hours of 9 AM and 5 PM. Even-numbered street addresses shall irrigate Wednesday, Friday, and Sunday. Odd-numbered street addresses shall irrigate Tuesday, Thursday, and Saturday. No irrigation shall be allowed on Monday. Daily hand watering with a hose or watering can is allowed. Strategy I irrigation hours shall apply to hand watering. Water use for maintenance of irrigation systems is permitted during all times of the day.
- b. Use water from a fire hydrant unless for public health or safety, or with the authorization of the Utilities Division.
- c. Waste water, as defined in section A.
- d. Irrigate golf courses with potable water.

New landscape permits. Daily irrigation of new landscape may be allowed for elective landscaping and will be allowed for required landscaping by obtaining a permit from the Water Conservation Office. The permit shall be good for a maximum of thirty (30) days. The fee for the permit shall be ten dollars (\$10) to cover administration and printing, and shall be adjusted to cover changing costs. The permit shall be obtained prior to landscape installation and prominently posted at the irrigation site. The determination of provision of an elective landscaping permit shall be made by a representative of the Utilities Division and may be appealed by the applicant to the Flagstaff Water

Commission if thought to be unreasonably denied. The decision of the Water Commission shall be final. Strategy I irrigation hours shall apply to irrigation permits.

2. Strategy II: Water Emergency (may implement with Resource Status II). In addition to the requirements of Strategy I, the following uses are restricted or prohibited.

No person shall:

- a. Irrigate or wash vehicles, except as provided. Even-numbered street addresses are restricted to said uses on Wednesday, Friday, and Sunday. Odd-numbered street addresses are restricted to said uses on Tuesday, Thursday, and Saturday. No outdoor watering activity shall be allowed between the hours of 9 AM and 5 PM. Vehicle washing for public health and safety shall be exempt. This restriction shall not apply to commercial car washes.
- b. Wash paved areas such as drives, sidewalks and tennis courts, or buildings, except for health or safety. Restriction shall not apply to commercial high pressure water blasting for maintenance or construction purposes during strategy II. The use of Reclaimed Water for said uses shall not be restricted.
- c. Use potable water for filling ornamental fountains, artificial ponds or streams.
- d. Fill recreational swimming pools, spas, or wading pools holding more than one hundred (100) gallons.
- e. Use potable water for major construction activity, such as dust control, soil compaction, or street cleaning. Major construction activity shall be considered that activity requiring the use of a hydrant meter for the dispensing of potable water or obtaining the water from City of Flagstaff standpipes.

Single-Family Residential, and all lawn meter rates shall increase to one hundred fifty percent (150%) of the established rate for any water consumption between six thousand two hundred one (6,201) and eleven thousand five hundred (11,500) gallons. Rates shall increase to two hundred percent (200%) of the established rate for any water consumption greater than eleven thousand five hundred one (11,501) gallons per billing cycle. Rate increases shall take effect with the billing cycle(s) following the implementation of Strategy II.

Multi-family, Commercial, Industrial, and Institutional water rates shall increase to 120% of the established rate. The rate increase shall take effect with the billing cycle(s) following the implementation of Strategy II.

Potable water standpipe rates shall increase to one hundred thirty percent (130%) of the established rate. The rate increase shall take effect upon implementation of Strategy II. Standpipe water shall be limited to uses within a twenty-five (25) mile radius of City Hall. Standpipe water shall not be used for major construction activity, dust control, irrigation of decorative landscaping and/or turf.

No new elective or required landscaping permits shall be issued. Landscaping not installed and required by the City of Flagstaff to meet the Land Development Code will not delay a Certificate of Occupancy to be issued providing its installation is delayed as a result of a suspension of new landscaping permits and a surety is provided acceptable to the Community Development Division. Upon suspension of Strategy II, rates shall return to their respective level with the billing cycle(s) following the date of the suspension, or in the case of standpipe rates, upon suspension.

3. Strategy III. Water Crises (may implement with Resource Status III). In addition to the requirements of Strategy I and Strategy II, the following uses are restricted or prohibited.

No person shall:

- a. Use any potable water for outside use.
- b. Use fire hydrants, unless for public health, safety, and welfare by authorized government agencies only.
- c. Waste water intentionally or unintentionally. Specifically applies to all residential, commercial, industrial, and institutional use.
- d. Use potable water in violation of any other restriction deemed necessary by the City Council for the purpose of protecting the welfare of the citizens of Flagstaff.

No new Special or Commercial provisions shall be allowed unless approved by the Flagstaff City Council or the Water Commission.

D. Surcharges/Appeals:

1. A Surcharge of \$25.00 shall be assessed to the account of record for a violation of Strategy I.
2. A Surcharge of \$50.00 shall be assessed to the account of record for a violation of Strategy II.
3. A Surcharge of \$100.00 shall be assessed to the account of record for a violation of Strategy III.

4. Surcharges shall double for every repeat violation. Each succeeding Surcharge under the prevailing strategy level may be twice the previous Surcharge assessed for the previous violation.
5. A commercial water hauler determined to be violating the standpipe restrictions shall pay a surcharge equal to that for the appropriate Strategy Level prior to the receipt of additional water.
6. The assessment of the Surcharge may be informally appealed, in writing, within fourteen (14) calendar days of the notice of the Surcharge assessment. The written appeal shall be received by the City of Flagstaff Utilities Division within said fourteen (14) day time limit or the right to such appeal shall be permanently waived. Address all Surcharge-related correspondence to:

City of Flagstaff Utilities Division  
Water Conservation Program Manager  
211 West Aspen Avenue  
Flagstaff, AZ 86001

**RECOMMENDATION / CONCLUSION:**

This report is for information only.